National Institute of Environmental Health Sciences

Estimating the economic impacts of climate change on infectious diseases: A case study on dengue fever in Taiwan

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Abstract:

Researchers of climate change have suggested that climate change and variability has a significant influence on the epidemiology of infectious diseases, particularly vector-borne diseases. The purpose of this study is to explore how climate conditions and the dengue fever epidemic in Taiwan are related and to estimate the economic impact of climate change on infectious diseases. To achieve these objectives, two different methods, one involving the Panel data model and the other the Contingent Valuation Method (CVM), are applied in this study. At first, we use the Panel data model to assess the relationship between climate conditions and the number of people infected by dengue fever during the period from January 2000 to February 2006 in 308 cities and townships in the Taiwan. The results of the empirical estimation indicate that climate conditions have an increasingly significant impact on the probability of people being infected by dengue fever. The probability of being infected by dengue fever due to climate change is then calculated and is found to range from 12% to 43% to 87% which represent low, mid, and high probabilities of infection caused by climate change when the temperature is increased by 1.8°C. The respondent's willingness to pay (WTP) is also investigated in the survey using the single-bounded dichotomous choice (SBDC) approach, and the results show that people would pay NT724, NT724NT 3,223 and NT$5,114 per year in order to avoid the increased probabilities of 12%, 43%, and 87%, respectively, of their being infected with dengue fever.

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Resource Description

Early Warning System: ☑

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure : ☑

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Meteorological Factors, Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

Urban, Other Geographical Feature

Other Geographical Feature : subtropical

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: Other Asian Country

Other Asian Country: Taiwan

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Dengue

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology:

type of model used or methodology development is a focus of resource

Cost/Economic, Outcome Change Prediction

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Short-Term (

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content